# The COS-Rocketeer

**The Official Journal of the Colorado Springs Rocket Society (COSROCS)**

**NAR Section #515**

**2002 LAC Award Winner!**

Volume 15, Issue 1-6 January-December 2004


## SpaceShip One Engineer of the Year
**(and COSROCS Member)**
## Jim Tighe
**At Challenger MS, 26 Dec 2004**

Photo courtesy Nadine Kinney.

**Disclaimer:** Most of the inputs for this issue were received in email form. Some of the launch logs were compiled from handwritten cards and logs, and were hard to read as a result. The editor did his best to decipher them and apologizes for any inadvertent errors. Special thanks to Nadine for the group photo.

## Inside this issue:

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Volume 15, Number 1-6
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***The COS-Rocketeer*** is the official journal of the Colorado Springs Rocket Society (COSROCS), NAR section #515. This journal, published bi-monthly by members of COSROCS, serves to provide information on all aspects of rocketry. Articles, rocket plans, and photos are always welcome. Items for publication should be submitted to the editor:

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COSROCS' membership dues are $20.00 per year per family. Junior memberships (under age 18) cost $5.00 per year. Checks should be made payable to COSROCS. Applications and payment should be mailed to the following address:

COSROCS
P.O. Box 15896
Colorado Springs, CO 80935-5896

The COSROCS phone number is (719)575-0060

If you have access to the Internet, COSROCS has a web site and a listserv. The COSROCS web site is:
http://www.cosrocs.org.

The e-mail address for the listserv is cosrocs@yahoogroups.com. To subscribe to the listserv, go to http://www.yahoogroups.com to register and select COSROCS.

COSROCS is a family-oriented club. Everyone is always welcome at our launches and meetings. Please join us. You'll have a blast!

COSROCS received the NAR's LAC Award (Rockwell Trophy) in 2000 and 2002 for having produced the best NAR Section newsletter.

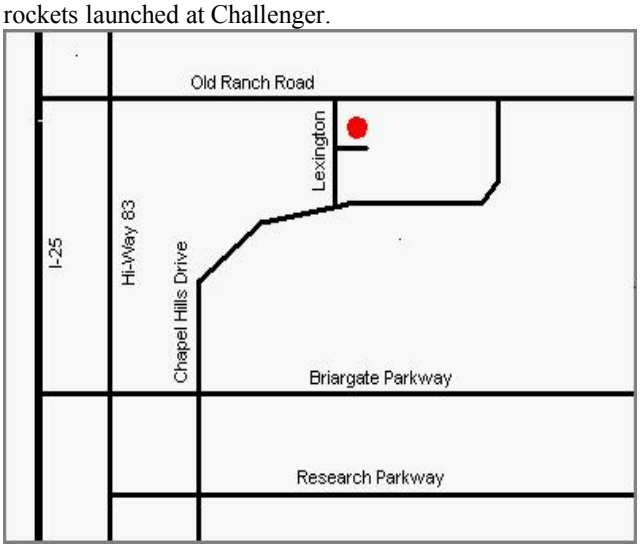
## COSROCS Officers (2004)

| | |
|---|---|
| President: | Greg Sandras, sandrasg@interserv.com |
| Vice President: | Neil Kinney, nkinney@aecom-sig.com |
| Section Advisor: | Warren Layfield, section515@juno.com |
| Secretary: | Nadine Kinney, photos.by.nadine@pcisys.net |
| Treasurer: | Mark James, markjames@pcisys.net |
| Librarian: | Dave Virga, virga@datawest.net |
| Contests: | Dave Nauer, david.nauer@wcom.com |
| Web Master: | Mark James, markjames@pcisys.net |

## Launches and Meetings

COSROCS holds a business meeting on the second Wednesday of every month from 7:00PM until 9:00PM. The meeting location is the Gold Hills Police Station at 705 South Nevada Ave., Colorado Springs.

COSROCS holds a sport launch on the second Saturday of each month, weather permitting. The launch is held at the Challenger Middle School, located at Lexington Blvd. in Colorado Springs. The launches begin at 9:00AM and last until approximately 12:00 noon. Our launches are free and open to the public. A one pound weight limit is imposed for rockets launched at Challenger.




COSROCS holds a sport launch on the fourth Saturday of each month at Cape Preble in Peyton, Colorado. The launches begin at 9:00AM. This launch site has a 3.3 pound weight limit for rockets. To get to this launch site, head east on Hwy 24 towards Peyton. Turn left on Peyton Highway, right after the little grocery store. After the curve, bear right onto north bound Peyton Hwy. Drive to Sweet Road, 4th turn on the right. Go approx 2 1/4 miles on Sweet road. On the left, near the bottom of the hill, is a gate to the launch site (21410 Sweet Road). Look for the green ranch gate.

## The Nagging Editor

By Tom Dembowski

OK, I know, I know. All I can say is things were lost, they are now found and so here we are. And now that we have an upgraded website, this will become much easier and timely. I really need your help to have something to put in each issue. Whenever there is an event, please just shoot me a few lines and/or a picture to include.

We also need to somehow make it easier to include our launch logs. I had to transcribe all the logs include here, it was a long and tedious process working from the original cards and/or paper copies. I don't mind doing it, but we need to save the logs after each launch and get them to me so I can include them in future issues.

Appreciate those who did send me articles to use in the newsletter. Thanks in advance for your help and keep those articles and pictures coming!

## The President Speaks!

By Dave Virga, COSROCS President (2004)

DON'T FORGET - Club launches moving from the 1st & 3rd Sat, to the 2nd and 4th weekends starting January 2005!

## Section News

Jim Tighe brought a couple items, a lapel pin and a hat from the Space Ship One flight. They were flown on the flight to space! - They flew on October 4th 2004. Jim and his parents visited with COSROCS at Challenger on Dec 26. He also signed some autographed pictures for the group.

Space Core Tech Conference: November 9, 2004, went very well. Warren went and spoke to the group.

Students watch the rocket launch marking the 40th anniversary of Irving Middle School on Tuesday afternoon, 18 May 2004. Students from Gracie Wright's Mathematics Engineering Science Achievement Club built the rockets, which were launched by members of the Colorado Springs Rocket Society. To be certain 40 rockets were launched, 48 were on the pads and 42 successfully launched.

## Flis Kits EMK4-24-80 Motor Mount Kit By Greg Elder

The Flis Kits EMK4-24-80 motor mount kit allows you to cluster four 24mm size motors in a BT-80 size body tube. The kit comes with four 4" long 24mm motor tubes, four motor blocks, and two fiberboard centering rings. Also included is a nice set of instructions—clearly illustrated, well written, and easy to follow.

This kit goes together quite well. You first glue in the motor blocks, positioning them depending if you are going to be using Estes D motors, or the longer Estes E and Aerotech F21. (I suggest positioning the motor blocks for the longer size motors, as you can always use spacers when you fly with the shorter length motors.) After marking the tubes for the centering rings, you position them one at-a-time in the rings. Once everything is aligned and the tubes even, you glue all the pieces together. You need to fill in the gap between the four motor tubes with tissue and glue in order to prevent the ejection gases from venting. As I said, construction is a snap.

I was a little concerned at first as to the strength of the mount since it used fiberboard centering rings. (Cluster mounts I had built in the past used plywood centering rings.) However, once the mount was completed and the glue dry, it feels very sturdy. By the way, the holes for the motor tubes in the centering rings are cut to precise dimensions—I did not have to sand any of the openings—great fit.

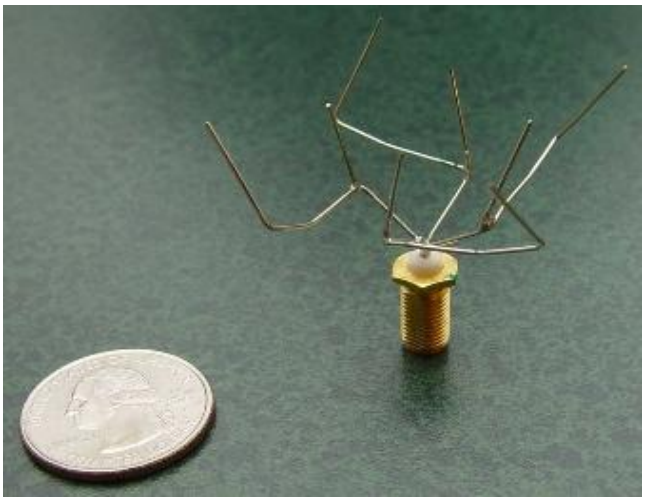
The only thing you might want to add with this kit would be engine hooks. Engine hooks would make inserting and removing the motors much easier. However, the hooks are not really needed and it's a personal preference for most people as to using engine hooks or not.

I plan to use this mount in an Estes Shadow that I have been waiting to build. When the rocket is complete and has its first launch, I will provide the details.

The EMK4-24-80 motor mount kit sells for a very reasonable $6.65. I recommend this kit if you are wanting to cluster four 24mm size motors.

## NASA: The Space Place

Submitted by Warren Layfield



**Antennas, Designed by Darwin**
by Patrick L. Barry

Who in their right mind would design this bizarre-looking antenna? Actually, nobody did. It evolved.

Taking a cue from nature, NASA engineers used a kind of "artificial evolution" to find this design. The result may look odd, but it works very well.

"The evolutionary process improves the design of antennas, just as evolution in nature leads to fitter plants and animals," says Jason Lohn, leader of the Evolvable Systems Group at NASA's Ames Research Center.

The improvement comes from Darwin's idea of natural selection: only the fittest members of a generation survive to produce offspring. Over many generations, traits that hinder survival are weeded out, while beneficial traits become more common. "In the end," he says, "you have the design equivalent of a shark, honed over countless generations to be well adapted to its environment and tasks."

Evolutionary computation, as it's called, applies this principle to hardware design. It's particularly useful for tackling problems that are difficult to solve by hand--like the design of new antennas.

Designing a new antenna for NASA's Space Technology 5 (ST-5) mission was the challenge facing Lohn's group. ST-5 will explore how TV-sized "nano-satellites" can perform the tasks of much larger, conventional satellites at a cheaper cost. Antennas on these satellites must be smaller than usual, yet capable of doing everything that a bigger antenna can do.

The evolution of this bizarre-looking antenna happened inside a computer. Many random designs were tested in a computer simulation. The computer judged their performance against certain goals for the design: efficiency, a narrow or wide broadcast angle, frequency range, and so on.

As in nature, only the best performers were kept, and these served as parents of a new generation. To make the new generation, the traits of the best designs were randomly mixed by the computer to produce fresh, new designs-just as a father and mother's genes are mixed to make unique children. This new generation was again tested in the computer simulation, and the best designs became the parents of yet another generation.

This process was repeated thousands, millions of times, until it settled onto an optimal, shark-like design that wouldn't improve any further. With today's fast computers, millions of generations can be simulated in only a day or so.

The result: an excellent antenna with an odd shape no human would, or could, design.

## COSROCS Items for Sale

**COSROCS Pins.** The COSROCS pins are still in. They look great. The pins have the COSROCS logo and a 1, 2, or 3 on them to indicate your certification level. Pins without a certification level are also available. The cost per pin is $5. Contact Warren Layfield if you want to purchase one.

## Mar. 7, 2004 Skyview MS Launch Log

| | | |
|---|---|---|
| Tom Dembowski | Flash | C6-7 |
| Warren Layfield | Purple Pill | C6-3 CATO! |
| Dave Virga | Big Bertha | C6-5 |
| Tom Dembowski | Bullpup | A8-3 |
| Dave Virga | Pratt Super Six | B6-4 |
| Greg Elder | Jenny (scratch) | Unk |
| Ernest Payton | Viking | A8-3 |
| Rick Hatton | Twister | A8-3 |
| Roy Deichmiller | Falcon | ½ A6-2 |
| Rick Hatton | Skywriter | A8-3 |
| Tony Armstrong | Heatseeker | A8-3 |
| Dave Virga | 24mm Saucer | D12-0 |
| Andrew Barentine | E-2X | B6-4 |
| Andrew Barentine | Falcon | B6-4 |
| Tom Dembowski | Alpha III | C6-7 |
| Tom Dembowski | SPEV | B6-2 |
| Rick Hatton | Intruder | A3-4T |
| Roy Deichmiller | Falcon | A8-3 |
| Ernie Payton | Scorpion | A8-3 |
| Andrew Barentine | Lawn Dart | B6-4 |
| Warren Layfield | Venus Probe | D12-3 |
| Tom Dembowski | Iris | B6-6 |
| Andrew Barentine | Lawn Dart | B6-4 |
| Dave Virga | Gnome | A10-0T/A10-3T |
| Michael Johnson | Alpha III | B6-4 |
| Ernie Payton | Viking | C6-5 |
| Rick Hatton | Gemini DC | B6-4 |
| Dave Virga | Hyper-X | B6-4 |
| Ernie Payton | Scorpion | C6-5 |

## Launch Report, 18 Apr 2004

| | | |
|---|---|---|
| Tom & Tommy Van DeWeghe | Rampage | B6-4 ? |
| Jeff Lewis | F22 | B6-? |
| Tim Van Milligan | Heli-Roc | ½ A3-2T |
| Dave Virga | MK-109 | B6-4 |
| Dave Jolly | Lil Orange | B4-4 |

## Launch Report 1 May 2004 Peyton CO

| | | |
|---|---|---|
| Mason Huyge | Obit | A10-0P |
| Matt Huyge | Saucer | A10-0P |
| Dave Virga | Big Bertha | C6-5 |
| John Jamison | Alpha III | Unk |
| Jeff Lewis | F22 | B6-? |

| | | |
|---|---|---|
| Kameson Hatton | Mercury Redstone | C6-3 |
| Dave Virga | Gnome | A10-0/A3-4T |
| George Shaiffer | Ring Hawk | C6-3 |
| Kameson Hatton | Mean Machine | D12-5 |
| Dave Jolly | Duck | D12-5 |
| Dave Jolly | Firebird | B4-4 |
| Mason Huyge | Superbird | C6-3 |
| Matt Huyge | Blue Ninja | E9-6 |
| Rick Hatton | Intruder | B4-4 |
| Rick Hatton | F22 | C6-3 |
| Tom Dembowski | Black Brant | C5-3 |
| Tom Dembowski | Chrome Dome | C6-7 |
| Tom Dembowski | Eliminator | D12-5 |
| Dave Jolly | Duck | D12-5 |
| Tom Dembowski | Eliminator | D12-3 |
| Tom Preble | Mach 12 | A8-3 |
| Tom Preble | Mach 12 | B6-4 |
| Dave Virga | AT Initiator | G337J |

## Launch Report 7 Aug 2004 Peyton CO

| | | |
|---|---|---|
| Jeff Lane | Microsonde IV | B6-4 |
| Allison Van Milligan | "Allison Rocket" | B6-4 |
| Samuel Pullen | Alpha | A8-3 |
| Rick Helton | Heleroc | A10-3T |
| Rick Helton | Orbiter | C6-3 |
| Jeff Lewis | Mustang | F20-7 |
| Greg Simonsen | Razor (upscale) | H238L |
| Greg Elder | Augie 2 | B6-0/A8-5 |
| Greg Fuller | Bandito | Unk |
| Mark James | Barracuda | F20-7 |
| Kimberley Fuller | Gemini | C6-5 |
| Jeff Lane | Delta Katt | A3-4T |
| Greg Elder | K-1 | D12-5 |
| Greg Elder | Tazmanian Devil | B6-2 |
| Jeff Lane | Saturn 1B (60's version) | C6-5 x 2 |
| Greg Simonsen | Comet | H128L |
| Jeff Lane | MPC (70's) | A8-3 |

## Launch Report 18 Sep 2004 Peyton CO

| | | |
|---|---|---|
| Greg Elder | V-2 | D12-3 |
| Greg Simonsen | (scratch) | G75-5 |
| Tom Dembowski | Firehawk | C6-5 |
| Greg Simonsen | Bug's Kamikaze | Unk |
| Kimberley Fuller | No-see-um | A10-0T/A3-4T |
| Tom Dembowski | American Eagle | Unk |
| Desiree | Rampage | Unk |
| Greg Elder | Broadsword | D12-3 |
| Tom Dembowski | Cobra | D12-5 |
| Greg Elder | Nike Smoke | C6-5 |
| Neil Kinney | Sumatar (?) | D12-? |
| Jeff Lewis | Broadsword | F40-4 |
| Neil Kinney | Saucer | A10-0T |
| Tom Dembowski | Starbird | C6-5 |
| Desiree | Alpha III | B6-4 |
| Greg Elder | Little Hercules | 1/2A6-2 |
| Tom Dembowski | Bullpup | B4-4 |
| Neil Kinney | Sumatar (?) | D12-? |
| Greg Elder | ? | C6-3 |
| Greg Simonsen | Pink Rocket | G40 |
| Tom Dembowski | Sentinal | C6-5 |
| Greg Elder | Mark II | A8-3 |
| Brian & Kalila Borden | Pizza Hut (MMIII) | D12(4)/D12 |
| Desiree | Wacky Wiggler | C6-3 |
| Tom Dembowski | SPEV | C5-3 |
| Daniel Simonsen | Alpha | C6-3 |

## Launch Report 2 Oct 2004 Challenger MS COS

| | | |
|---|---|---|
| Greg Elder | Long Spool | C11-3 |
| Tom Dembowski | Starbird | A8-3 |
| Russ Gordon | Big Rage | C6-5 |
| Will Keebaugh | Custom | A8-3 x 3 |
| Tom Dembowski | Streak | A8-3 |
| Ken Bates | Guardian | B6-4 |
| Neil Kinney | (scratch) | A8-3 |
| Jeff P. | Solar Sailer II | B6-4 |
| Greg Simonsen | ? | C6-5 |
| Neil Kinney | USA | B6-4 |
| Dave Virga | Penroc | MMX II |
| Desiree Scott | Wacky Wiggler | C6-3 |
| George Shaiffer | V-2 | D12-5 |
| Russ Gordon | Cosmic Cobra | C? |
| David Virga | Snapshot | C6-7 |
| Greg Elder | Birdie | A10-PT |
| Russ Gordon | Quasar | C? |
| Tom Dembowski | Sentinal | C6-5 |
| Jeff P. | Skybolt | B6-4 |
| Greg Elder | Mini-pyramid | A10-PT |
| Ken Bates | Viking | A8-3 |
| Russ Gordon | Storm Chaser | C? |
| Greg Elder | Saucer | D12-0 |
| David Virga | Super Eagle | C6-3 |
| Russ Gordon | Chrome Domes | C? |
| Ken Bates | Viking | A8-3 |
| Tom Dembowski | Sprite | A8-3(S) |
| Will Keebaugh | Big Daddy | D12-3 |
| Russ Gordon | Blue Ninja | C11-3 |
| Tom Dembowski | Firehawk | C6-5 |
| Ken Bates | Guardian | A8-3 |
| Russ Gordon | Fat Boy | C6-3 |
| Jeff P. | 220 Swift | 1/2A3-4T |
| Greg Elder | Cinco | A10-PT |
| Will Keebaugh | ? | A10-3T |
| Tom Dembowski | Flash | C6-7 |
| Greg Elder | Orbit | A10-PT |
| Dave Virga | PenRoc | MMX I |
| Will Keebaugh | Big Daddy | D12-3 |
| Russ Gordon | Falcon | C? |
| Tom Dembowski | American Eagle | A8-3 |
| George Shaiffer | Wiggler | C6-3 |
| Tom Dembowski | Mini V-2 | 1/2A3-2 |

## Photos Page

Demo launch at Challenger Middle School, 7 May 2004. (Photos by Dave Virga)


Our fearless leader, Gold Camp Elementary Pack 8 launch, Challenger Middle School, 5 Nov 2004
(Photo from Virga Archives)


Setting up for launch, 5 Nov 2004.
(Photo from Virga archives)

Setting up at Challenger 5 Nov 2004
(Photo by Dave Virga)

SpaceShip One engineer Jim Tighe (back row, fourth from right) visits with COSROCS, 26 Dec 2004 at Challenger MS. Jim's parents on left (back row), also present are COSROCS members George Shaiffer, Tom Dembowski, Mark James, Dr Warren Layfield, and Nadine Kinney.

(Photo courtesy Nadine Kinney)

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